

Mosaic Decal Probe

ABSTRACT

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The invention provides a mosaic decal probe, in which a mosaic of probe chips is assembled into a thin membrane that is suspended in a ring which is made of a material that has a TCE matching that of silicon. The membrane is mounted on the ring in tension, such as it stays in tension throughout a functional temperature range.

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In this way, the membrane exhibits a functional TCE matching that of the ring. The probe chip preferably has spring contacts on both sides. Apertures are cut in the membrane to allow the spring contacts on one side of the membrane to protrude through the membrane and contact the printed wiring board. The spring contacts which contact the printed wiring board are allowed to slide during temperature

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excursions, thereby decoupling the TCE mismatch between the probe chip and the printed wiring board. Two preferred embodiments are currently contemplated. A first embodiment of the invention uses a low-count mosaic comprised of few probe chips, for example four probe chips. The probe chips have the same TCE as the wafer under test, *e.g.* silicon. In this embodiment, the probe chip is peripherally attached to

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the membrane. A second embodiment of the invention provides a high-count mosaic, using a high number of probe chips, for example nine or more probe chips. In this embodiment, the probe chips are smaller and can have a slight TCE difference from that of the test wafer, *e.g.* silicon. For example, the probe chips may be made out of a ceramic material. This embodiment of the invention uses a center

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attachment to secure the probe chips to the membrane.